

prescribed treatments fully respected the recommended first-line treatments (ceftriaxone 250 mg or cefixime 800 mg in combination with azithromycin 1g). Among the 731 (59%) episodes with a test of cure performed, 47 (6.4%) were positive; specific questionnaires for the treatment failure assessment were available for 28. After analysis, 5 episodes were classified as retained or suspected treatment failure, including 4 pharyngeal infections and 2 cases who received azithromycin monotherapy. In 2018 (preliminary data), 15 additional assessment questionnaires were completed, adding 5 treatment failures (3 suspected and 2 retained).

**Conclusion** The results of the sentinel network help to guide Quebec public health decision-making. When certain B-lactam allergy forces clinicians to prescribe an alternative treatment, a dual therapy including gentamicin is now recommended. Overrepresentation of azithromycin monotherapies among treatment failures in the sentinel network also contributed to this recommendation change.

**Disclosure** No significant relationships.

#### P678 AN EFFECTIVE GONOCOCCAL LIPOOLIGOSACCHARIDE (LOS) VACCINE: WE KNOW ENOUGH TO MAKE ONE

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**Background** Long-lived gonococcal LOS IgG, induced during an initial challenge, prevented re-infection in 7/8 subjects ( $v. = 1/6$ ;  $p=0.026$ ), but treatment within three days of urethritis onset prevented an antibody response. This suggested that recidivism was related to early treatment. These data form the basis for an effective LOS vaccine.

**Methods** MS, NMR Spectroscopy and immunochemistry were used to structure the LOS made by the challenge strain, MS11mkC. Gonococci in scrapings of diagnostic slides were LOS genotyped. A multiplexed indirect immunofluorescent assay for LOS IgG was used to quantify LOS IgG.

**Results** MS11mkC LOS are genetically identical to those of gonococci within PMNs, with two  $\alpha$  oligosaccharide chains, nLc4 (Gal $\beta$ 1-4GlcNAc $\beta$ 1-3Gal $\beta$ 1-4Glc $\beta$ ) and GalNAC-nLc4 (GalNAC $\beta$ 1-3-nLc4). Protective MS11mkC LOS IgG should protect against all circulating gonococci. The multiplex assay detected IgG specific for the nLc4 terminal Gal residue, the internal nLc3 GlcNAc and the basal Lc2 disaccharide. Concentrations ( $\mu\text{g/mL}$ ) of IgG in sera of contacts of persons with gonorrhoea, specific for the three antigens, summed to the concentrations that bound the native nLc4  $\alpha$  chain and were greater in sera from those seen  $\geq 7$  days after exposure than those seen earlier ( $p = 0.04$  for the nLc4 Terminal Gal comparison). Contacts of persons with gonorrhoea who resisted infection circulated higher concentrations of IgG specific for the nLc4 terminal Gal than those who became infected during exposure ( $\Delta = 1.78 \mu\text{g/mL}$ ;  $p = 0.10$ ). The  $1.78 \mu\text{g/mL}$  difference is close to the  $2 \mu\text{g/mL}$  that provides protection against meningococcal infection.

**Conclusion** An effective gonococcal vaccine can be made based on the human challenge study and an understanding of the immunochemistry of LOS. Gonococcal LOS is not pyrogenic in rabbits and can be made less so by deletion of *lptA*. A seed strain that is suitable for industrial production is available, as is an immunogenicity assay.

**Disclosure** No significant relationships.

#### P679 NEISSERIA GONORRHOEAE (GC) CULTURE POSITIVITY BY INDICATION FOR CULTURE AND ANATOMIC SITE, SEATTLE, WASHINGTON, 2017–2018

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**Background** In order to increase the number of gonococcal isolates available for antimicrobial susceptibility surveillance, we expanded indications for GC culture in a municipal STD clinic in Seattle, Washington. We evaluated GC culture positivity by clinical criteria.

**Methods** In 2017–2018, GC culture specimens were collected from STD clinic patients who met these criteria: (1) contact to GC, (2) GC NAAT+ not yet treated, or (3) symptomatic urethritis/cervicitis with intracellular diplococci on gram stain. Clinicians inoculated Modified Thayer-Martin agar plates at the bedside and incubated in a candle jar. Patient characteristics and indication for culture were abstracted from medical records; culture positivity was compared by indication, anatomic site, and patient group with Fisher's exact test.

**Results** Clinicians collected a total of 3,884 specimens, of which 1,107 (29%) were GC culture positive. Culture positivity among 74 endocervical, 1,611 pharyngeal, 1,154 rectal, and 1,045 urethral isolates was 30%, 17%, 29%, and 46%, respectively. Among contacts to GC, endocervical culture positivity was 6/26 (23%), pharyngeal 79/752 (11%), rectal 88/549 (16%), and urethral 71/445 (16%). Urethral culture positivity in male contacts without urethral discharge was low (6/221 [3%]). Pharyngeal culture positivity among GC contacts who were men who have sex with men was similar to heterosexual men (10% of 719 vs 12% of 17,  $p=0.68$ ) but lower than pharyngeal positivity among women (43% of 14,  $p<0.01$ ). Among patients with a recent NAAT+ screening test, cultures were positive in 12/35 (34%) endocervical, 133/514 (26%) pharyngeal, 168/337 (50%) rectal, and 30/94 (32%) urethral specimens. Most (91% of 476) men with urethritis and intracellular diplococci on gram stain were culture positive.

**Conclusion** Men with symptomatic urethritis had the highest GC culture yield (91%), followed by persons with recent GC NAAT+ (26–50%). Cultures in GC contacts had a modest yield (11%–23%). These criteria were appropriate for obtaining GC isolates for antimicrobial surveillance.

**Disclosure** No significant relationships.

#### P680 OROPHARYNGEAL GONORRHOEA IN THE ABSENCE OF UROGENITAL GONORRHOEA IN A SEXUAL NETWORK OF MALES AND FEMALES

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**Background** We describe a sexual network consisting of two males and five females who were tested for gonorrhoea at

genital and oropharyngeal sites in early 2018, with the aim of exploring whether tongue kissing transmits gonorrhoea.

**Methods** Participants independently provided extremely detailed interview accounts of sexual activity with one another, to permit inter-participant verification. Testing for *N. gonorrhoeae* was by nucleic acid amplification testing (NAAT). Whole genome sequencing (WGS) was performed on available culture-positive samples to assess genomic relatedness between samples.

**Results** Sexual contact included tongue kissing for all participants, and many participants participated in oro-genital and genito-genital intercourse with one another. All sexual contact occurred during a 1-week period in Victoria, Australia. Two participants had samples available for WGS and these were highly related genomically, and these participants were separated in this network by two other participants. All seven participants had gonorrhoea, six participants had oropharyngeal gonorrhoea in the absence of genital gonorrhoea, and the other participant had only vaginal gonorrhoea. No men acquired urethral gonorrhoea.

**Conclusion** The fact that six of seven participants had oropharyngeal gonorrhoea in the absence of urogenital gonorrhoea supports the notion that tongue kissing is a common mode of gonorrhoea transmission. No men acquired urethral gonorrhoea from oro-penile sex, suggesting that transmission from oropharynx to urethra may be less likely than by tongue kissing. Our WGS results, when viewed in conjunction with the extremely-detailed sexual behaviour data, support the notion that gonorrhoea diagnoses in this network were likely the result of within-network transmission. Our findings highlight the need for more research to define the transmission routes for gonorrhoea in heterosexuals, to inform screening policies.

**Disclosure** No significant relationships.

P681

#### IMPORTATION OF CIPROFLOXACIN RESISTANT *NEISSERIA GONORRHOEA* INTO THE UK: A PUBLIC HEALTH CHALLENGE

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**Background** Current UK guidelines for managing *Neisseria gonorrhoeae* (NG) infection include ciprofloxacin use if antimicrobial susceptibility is indicated, but this option would be less useful if ciprofloxacin resistant NG (CpR-NG) rates increased, for example to levels reported in some parts of Asia. CpR-NG rates in the Americas are lower than in the UK. We investigated whether having recent condomless sex in "high" CpR-NG (HCpR-NG) regions (sex abroad, but not in the Americas) was associated with being infected with CpR-NG.

**Methods** We conducted two cross-sectional surveys of UK Sexual Health Clinics (March 2015-March 2016; May 2017-June 2018). Patients aged  $\geq 16$  years with symptoms of an STI

provided samples: vulvovaginal swab (females); first void urine (men-who-have-sex-with-women (MSW) and men-who-have-sex-with-men (MSM)); pharyngeal and rectal swabs (MSM). Data were collected on travel-associated sexual behaviour, including condomless sex abroad (CSA) in the past three months with a new partner. Routine clinic NG results were obtained. Resistance-associated mutations in *gyrA* (fluoroquinolones) for NG were identified using Sanger sequencing. Patients reporting CSA in HCpR-NG regions were compared to no sex abroad using Pearson's chi-squared test and multi-variable logistic regression models.

**Results** Overall, 71/1055 (6.7%) reported CSA in HCpR-NG regions. Of these, 12/71 (16.9%) compared to 85/984 (8.6%) not reporting CSA had NG ( $p=0.02$ ). Among-NG positive patients, fluoroquinolone resistant mutations were found in 9/12 (75.0%) patients reporting CSA in HCpR-NG regions, compared to 35/85 (41.2%) who did not report CSA ( $p=0.03$ ). After adjustment for other risk factors, the association between fluoroquinolone resistant NG and CSA in HCpR-NG regions remained significant (aOR:2.33[95% CI:1.03–5.24]).

**Conclusion** Having recent condomless sex with a new partner in regions of high ciprofloxacin resistance was associated with being NG-positive in the UK and having ciprofloxacin resistant NG. Importation of resistance may undermine attempts to recycle older antibiotics in the management of NG infection.

**Disclosure** No significant relationships.

P682

#### EFFICACY OF SECURIDACA LONGIPENDUCLULATA FRESEN (POLYGALACEAE) AGAINST STANDARD ISOLATES OF *NEISSERIA GONORRHOEA*

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**Background** A study was carried out to determine the in vitro antibacterial activity of ethanol extract of root and bark of *Securidaca longipendunculata* against standard isolates of *Neisseria gonorrhoeae*.

**Methods** The plant materials were collected early in the morning and dried at room temperature, followed by ethanol extraction using a rotary pump. Antibacterial activity assay was done against two bacterial isolates, viz. US standard isolate NO. 0296 and WHO standard isolate K using the agar diffusion method with dimethyl sulphoxide as a negative control and ceftriaxone antibiotic as a positive control. Antimicrobial activity was determined by measuring the zone of inhibition around each well. The minimum inhibitory concentration of the extract was determined using different concentrations of the extract and plated on the GC media. For each extract six replicate trials were conducted against each organism. The protocol of Odebiyi and Herbune (1978) was followed to determine the presence of phytochemical compounds.

**Results** The results obtained showed that both the root and bark extracts of *Securidaca longipendunculata* have antibacterial activity against the two bacterial strains with a zone of inhibition of  $\geq 10$ mm in both root and bark and a bactericidal activity at  $10^{-2}$  thus 0.01  $\mu\text{g/ml}$  of 10% crude extract in tube dilution. The antibiotic susceptibility tests on the common antibiotics in comparison with the extract showed that the root and bark extract have a higher susceptibility than